

환경 및 산업보건			번호: J - C - 9		
제 목	국문	Ciga-X가 인간폐섬유세포 파괴 및 흡연욕구에 미치는 영향			
	영문	Ciga-X inhibits nicotine-induced human lung fibroblasts cytotoxicity and craving for cigarettes			
저 자 및 소 속	국문	김미선 <sup>1)</sup> , 진종식 <sup>1)</sup> , 안효진 <sup>1)</sup> , 박도영 <sup>2)</sup> , 박수정 <sup>2)</sup> , 김형균 <sup>3)</sup> , 김형민 <sup>1)</sup> , 모영하 <sup>4)</sup> , 오경재 <sup>4)</sup> , 김남송 <sup>4)</sup> 1) 원광대학교 약학대학 한약학과, 2) HUMANBIO(주), 3) 원광대학교 한의과 대학, 4) 원광대학교 의과대학 예방의학교실			
	영문	Mi-Sun Kim <sup>1)</sup> , Jong-Sik Jin <sup>1)</sup> , Hyo-Jin An <sup>1)</sup> , Do-Young Park <sup>2)</sup> , Su-Jung Park <sup>2)</sup> , Hyeong-Kyun Kim <sup>3)</sup> , Hyung-Min Kim <sup>1)</sup> , Young-Ha Mo <sup>3)</sup> , Gyung-Jae Oh <sup>3)</sup> , Nam-Song Kim <sup>3)</sup> 1) Department of Oriental Pharmacy, College of Pharmacy, Wonkwang University, 2) HUMANBIO Co. Ltd., 3) College of Oriental Medicine, Wonkwang University, and 4) Department of Preventive Medicine, College of Medicine, Wonkwang University			
분 야	환경 및 산업보건	발 표 자		발표형식	포스터
진행상황	연구완료				
<p>1. 연구목적</p> <p>Cigarette smoking contributes to lung cancer, cardiovascular diseases, oral diseases, etc. In desire to reduce their risk of disease, many cigarette smokers have tried to quit smoking. Sensory aspects of cigarette smoke are important for providing smoking satisfaction. Previously reported that citric acid aerosol significantly reduced craving for cigarettes and enhances smoking reduction and cessation. In this study, we tested whether a newly combined product Ciga-X, an aerosol for cessation aid, had toxicity in human embryonic lung fibroblast (MRC-9).</p> <p>2. 연구방법</p> <p>Cell culture</p> <p>MRC-9 was obtained from Korea Research Institute of Bioscience and Biotechnology (Taejon, Korea). MRC-9 was grown in RPMI 1640 medium supplemented with 100 U/ml penicillin, 100 µg/ml streptomycin and 10% heat-inactivated fetal bovine serum (FBS) at 37°C in 5% CO<sub>2</sub> and 95% humidity.</p> <p>MTT assay</p> <p>To investigate the viability of cells, MTT assay was performed (Mosman et al., 1983; Kim</p>					

et al., 2001).

#### Craving for cigarettes and satisfaction test

140 smokers (men) were participated in craving for cigarettes and satisfaction test. In the test of craving for cigarettes, subjects were asked to rate how much they felt craving reduction for their brand of cigarette after using Ciga-X. Subjects rated using 10-point scales ranging from 1 ("not at all") to 10 ("very much"). In the satisfaction test, subjects were asked to rate how much they felt satisfaction for Ciga-X compared to their usual brand of cigarette after using Ciga-X. The degree of satisfaction was rated a 10-point scales from 1 ("not at all") to 10 ("own brands").

#### Statistical analysis

Results were expressed as the mean  $\pm$  SD from four independent experiments. The significance of the differences between two groups was determined by the Mann-Whitney U test. Subjects were divided into two groups according to the duration they had been smoking (under or over 10 yr), and the degree of decrease craving and satisfaction was "5" as a datum point in analysis. In craving for cigarettes and satisfaction test, the association was analyzed by Chi-square test (Pearson  $\chi^2$ -test). For all tests, p values less than 0.05 were considered significant.

### 3. 연구결과

#### No cytotoxic effect of Ciga-X in MRC-9

To test cytotoxic effects of Ciga-X, aerosol for cessation-aid, we performed MTT assay in MRC-9 cells. In cells treated with Ciga-X of various concentrations, Ciga-X didn't affect cell viability in each concentration and had no toxicity on MRC-9 cells.

#### Inhibitory effect on CSE- and nicotine-induced cytotoxicity

In order to determine the inhibitory effect of Ciga-X on CSE- or nicotine-induced cytotoxicity, we pretreated with Ciga-X and then CSE or nicotine were treated. After incubating for 24 h, cell viability was measured by MTT colorimetric assay. CSE had cytotoxic effect in comparison with absence of CSE (about 63% cell death). Ciga-X significantly inhibited CSE-induced cytotoxic effect in MRC-9 (about 50% recovery in cell death). Nicotine also showed cytotoxicity even in somewhat (about 18% cell death). Ciga-X blocked nicotine-induced cytotoxic effect and increased cell viability near 100% in MRC-9.

#### Inhibitory effect on craving for cigarettes and satisfaction test

The percentage of over 5 rating was 71.4 % in satisfaction test for Ciga-X compared to their own brand. The 50.0 % of subjects also reported over 5 rating in craving reduction for cigarette by using Ciga-X. There was a significant interaction of reduction craving and

smoking duration. Subjects have smoked under 10 yr were more reduced in craving for cigarettes after using Ciga-X as compared to over 10 yr. It showed that the trend for cigarette craving after using Ciga-X in subjects smoked for a short time was lower than in subjects smoked for a long time. But, satisfaction was not significant according to smoking duration.

#### 4. 고찰

In the present study, we demonstrated that Ciga-X had no toxic effects on human lung fibroblasts and exhibited significant inhibitory effect on CSE- and nicotine-induced cytotoxicity in MRC-9. One factor probably account for the lower ratings of craving reduction and satisfaction in designed study. Our question study wasn't limited subjects desired to quit smoking. Nevertheless, more than half of subjects felt satisfaction after using Ciga-X and craving reduction. Ciga-X delivered from a cigarette substitute may be effective in reducing smoking and promoting smoking abstinence through tracheal stimuli and local anesthesia.